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ABSTRACT

This booklet focuses on aspects of effective education that appear to be universal in formal schooling. The practices, which are generally for use in elementary and secondary classrooms, show large, positive learning effects for students in widely varying conditions. Information in the booklet is based on research spanning half a century. Each section begins by presenting findings from the research, then follows up with a discussion of the topic in the classroom. The 10 sections are as follows: (1) "Parent Involvement"; (2) "Graded Homework"; (3) "Aligned Time on Task"; (4) "Direct Teaching"; (5) "Advance Organizers"; (6) "The Teaching of Learning Strategies"; (7) "Tutoring"; (8) "Mastery Learning"; (9) Cooperative Learning"; and (10) "Adaptive Education." (Contains 41 references.) (SM)

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Effective educational practices

Herbert J. Walberg
and Susan J. Paik

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Preface

This booklet on effective educational practices has been adapted for inclusion in the Educational Practices Series developed by the International Academy of Education and distributed by the International Bureau of Education and the Academy. As part of its mission, the Academy provides timely syntheses of research on educational topics of international importance. This booklet is the third in the series on educational practices that generally improve learning.

I originally prepared the material in this booklet for the generic section of the *Handbook of research on improving student achievement*, edited by Gordon Cawelti, and published in a second edition in 1999 by the Educational Research Service (ERS). The *Handbook*, which also includes chapters on subjects such as mathematics and science, is available from ERS (2000 Clarendon Boulevard, Arlington, VA 22201-2908, United States of America; telephone: (1) 800-791-9308; fax: (1) 800-791-9309; e-mail: msic@ers.org; and web site: www.ers.org).

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For their review of the material in this booklet, I thank Professors Lorin Anderson, Jere Brophy and Margaret Wang, and fourteen of my doctoral students. Any shortcomings of this booklet are attributable to me.

I also thank my co-author, Susan Paik, for helping to adapt the material in my *Handbook* chapter for this booklet intended for educators in various parts of the world. Susan is a doctoral candidate at the University of Illinois at Chicago, where she has taught. As a volunteer, she has participated in projects in Africa, Asia, Central America, Europe and the United States. She has presented her research at Oxford University in the

United Kingdom, the University of Cape Town in South Africa, and at professional meetings in Australia, South America and the United States. In Chicago, she founded and directed a character-development programme for inner-city youth.

The officers of the International Academy of Education are aware that this booklet is based on research carried out primarily in economically advanced countries. The booklet, however, focuses on aspects of learning that appear to be universal in much formal schooling. The practices presented here seem likely to be generally applicable throughout the world. Even so, the principles should be assessed with reference to local conditions, and adapted accordingly. In any educational setting, suggestions or guidelines for practice require sensitive and sensible application, and continuing evaluation.

HERBERT J. WALBERG,
Editor, IAE Educational Practices Series,
University of Illinois at Chicago.

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Introduction

The practices described in this booklet can generally be applied to classroom subjects in primary and secondary schools. They show large, positive learning effects for students in widely varying conditions. Educators may find the many references valuable in investigating the applicability of the practices in their particular circumstances. As with all educational practices, of course, they can be effectively or ineffectively planned and conducted, and the results may vary accordingly.

The research on these practices has accumulated over half a century. Several of the major references used are studies conducted by my colleagues and myself. These studies compiled the results of research summaries and synthesized several hundred investigations of educational practices by many scholars. The practices were further investigated by analysing large national and international achievement surveys. Much of the research employed examinations covering the facts and principles of the usual or predominant academic subjects. The research is less pertinent to art, music and athletics, subjects that may have a more behavioural and less academic emphasis. Nor did the research concentrate on such aspects of learning as writing, problem-solving and completing laboratory projects. Research on these subjects and skills may be found in the references and elsewhere, and the Academy may sponsor booklets on these matters.

As mentioned above, the practices in this booklet are generally powerful and consistent in promoting important aspects of academic learning. Some other practices are nearly as good. For further reading on many effective practices, the following works may be consulted: Husén & Postlethwaite, 1994; Lipsey & Wilson, 1993; Walberg, 1984; Walberg & Haertel, 1997; Wang, Haertel & Walberg, 1993b; and Waxman & Walberg, 1999.

1. Parent involvement

Learning is enhanced when schools encourage parents to stimulate their children's intellectual development.

Research findings

Dozens of studies have shown that the home environment has a powerful effect on what children and youth learn within and outside school. This environment is considerably more powerful than the parents' income and education in influencing what children learn in the first six years of life and during the twelve years of primary and secondary education. One major reason that parental influence is so strong is that, from infancy until the age of 18, children spend approximately 92% of their time outside school under the influence of their parents.

Co-operative efforts by parents and educators to modify these alterable academic conditions in the home have strong, beneficial effects on learning. In twenty-nine controlled studies, 91% of the comparisons favoured children in such programmes over non-participant control groups.

In the classroom

Sometimes called 'the curriculum of the home', the home environment refers to informed parent/child conversations about school and everyday events; encouragement and discussion of leisure reading; monitoring and critical review of television viewing and peer activities; deferral of immediate gratification to accomplish long-term goals; expressions of affection and interest in the child's academic and other progress as a person; and perhaps, among such unremitting efforts, laughter and caprice. Reading to children and discussing everyday events prepare them for academic activities before attending school.

Co-operation between educators and parents can support these approaches. Educators can suggest specific activities likely to promote children's learning at home and in school. They can also develop and organize large-scale teacher/parent programmes to promote academically stimulating conditions and activities outside the school in a systematic manner.

References: Graue, Weinstein & Walberg, 1983; Iverson & Walberg, 1982; Peng & Wright, 1994; Stevenson, Lee & Stigler, 1986; Walberg, 1984; Walberg & Paik, 1997. Also, see the second booklet in the present series—*Parents and learning* by Sam Redding—which is devoted to this same subject.

2. Graded homework

Students learn more when they complete homework that is graded, commented upon and discussed by their teachers.

Research findings

A synthesis of more than a dozen studies of the effects of homework in various subjects showed that the assignment and completion of homework yield positive effects on academic achievement. The effects are almost tripled when teachers take time to grade the work, make corrections and specific comments on improvements that can be made, and discuss problems and solutions with individual students or the whole class. Homework also seems particularly effective in secondary school.

In the classroom

Among developed countries, the United States has the least number of school days because of the long summer vacation. Students also spend less time, on average, doing homework. Extending homework time is a proven way to lengthen study time and increase achievement, although the quality of the assignments and of the completed work are also important.

Like a three-legged stool, homework requires a teacher to assign it and provide feedback, a parent to monitor it and a student to do it. If one leg is weak, the stool may fall down. The role of the teacher in providing feedback—in reinforcing what has been done correctly and in re-teaching what has not—is the key to maximizing the positive impact of homework.

Districts and schools that have well-known homework policies for daily minutes of required work are likely to reap benefits. Homework 'hotlines' in which students may call in for help have proved useful. To relieve some of the workload of grading, teachers can employ procedures in which students grade their own and other students' work. In this way, they can learn co-operative social skills and how to evaluate their own and others' efforts.

The quality of homework is as important as the amount. Effective homework is relevant to the lessons to be learned and in keeping with students' abilities.

References: Paschal, Weinstein & Walberg, 1984; Stevenson, Lee & Stigler, 1986; Walberg, 1984, 1994; Walberg & Haertel, 1997.

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3. Aligned time on task

Students who are actively focused on educational goals do best in mastering the subject matter.

Research findings

More than 130 studies support the obvious idea that the more students study, the more they learn. It is one of the most consistent findings in all educational research. Time alone, however, does not suffice. Learning activities should reflect educational goals. This alignment or co-ordination of means with goals can be called 'curricular focus'. A similar reform term is 'systemic reform', which means that the three components of the curriculum—(1) goals, (2) textbooks, materials and learning activities, and (3) tests and other outcome assessments—are well matched in content and emphasis.

In the classroom

The amount learned reflects both study time and curricular focus. Curricular focus represents efforts to decide what should be learned by a given age or grade level, and then concentrating attention, time and energy on these elements. Consequently, students at a given grade level should have greater degrees of shared knowledge and skills as prerequisites for further learning; teachers may then avoid excessive review; and progress can be better assessed.

Teachers have the most direct role in ensuring that this emphasis is carried into the classroom. The teacher's skilful classroom management, by taking into account what is to be learned and identifying the most efficient ways to present it, increases effective study time. Students who are actively engaged in activities focused on specific instructional goals make more progress towards these goals.

References: Anderson & Walberg, 1994; Fredrick, 1980; Fredrick & Walberg, 1980; Stigler, Lee & Stevenson, 1987; Walberg & Fredrick, 1991; Walberg & Haertel, 1997; Walberg & Paik, 1997; Waxman & Walberg, 1999.

4. Direct teaching

Direct teaching is most effective when it exhibits key features and follows systematic steps.

Research findings

Many studies show that direct teaching can be effective in promoting student learning. The process emphasizes systematic sequencing of lessons, a presentation of new content and skills, guided student practice, the use of feedback and independent practice by students. The traits of teachers employing effective direct instruction include clarity, task orientation, enthusiasm and flexibility. Effective direct teachers also clearly organize their presentations and occasionally use student ideas.

In the classroom

The use of direct teaching can be traced to the turn of the last century; it is what many citizens and parents expect to see in classrooms. Done well, it can yield consistent and substantial results. Whole-class teaching of diverse groups may mean that lessons are too advanced for slower students and too repetitive for the quick. In the last decade or two, moreover, theorists have tried to transfer more control of lesson planning and completion to students themselves so that they 'learn to learn', as several subsequent practices exemplify.

Six phased functions of direct teaching work well:

1. Daily review, homework check and, if necessary, reteaching;
2. Presentation of new content and skills in small steps;
3. Guided student practice with close teacher monitoring;
4. Corrective feedback and instructional reinforcement;
5. Independent practice in work at the desk and in homework with a high (more than 90%) success rate; and
6. Weekly and monthly reviews.

References: Brophy & Good, 1986; Gage & Needles, 1989; Walberg & Haertel, 1997; Wang, Haertel & Walberg, 1993*a*, 1993*b*; Waxman & Walberg, 1999.

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5. Advance organizers

Showing students the relationships between past learning and present learning increases its depth and breadth.

Research findings

More than a dozen studies have shown that, when teachers explain how new ideas in the current lesson relate to ideas in previous lessons and other prior learning, students can connect the old with the new, which helps them to better remember and understand. Similarly, alerting them to the learning of key-points allows them to concentrate on the most crucial parts of the lessons.

In the classroom

Advance organizers help students focus on key ideas by enabling them to anticipate which points are important to learn. Understanding the sequence or continuity of subject-matter development, moreover, can be motivating. If students simply learn one isolated idea after another, the subject-matter may appear arbitrary. Given a 'mental road map' of what they have accomplished, where they are presently, and where they are going can avoid unpleasant surprises and help them to set realistic goals. Similar effects can be accomplished by goal-setting, overviewing and pre-testing before lessons that sensitize students to important points and questions that they will encounter in textbooks and will be presented by teachers.

It may also be useful to show how what is being learned solves problems that exist in the world outside school and that students are likely to meet in life. For example, human biology that features nutrition and its implications for food choices is likely to be more interesting than abstract biology.

Teachers and textbooks can sometimes make effective use of graphic advance organizers. Maps, timetables, flow charts depicting the sequence of activities, and other such devices may be worth hundreds of words. They may also be easier to remember.

References: Ausubel, 1968; Walberg & Haertel, 1997; Walker, 1987; Weinert, 1989.

6. The teaching of learning strategies

Giving students some choice in their learning goals and teaching them to be attentive to their progress yield learning gains.

Research findings

In the 1980s, cognitive research on teaching sought ways to encourage self-monitoring, self-teaching or 'meta-cognition' to foster achievement and independence. Skills are important, but the learner's monitoring and management of his or her own learning have primacy. This approach transfers part of the direct teaching functions of planning, allocating time and review to learners. Being aware of what goes on in one's mind during learning is a critical first step to effective independent learning.

Some students have been found to lack this self-awareness and must be taught the skills necessary to monitor and regulate their own learning. Many studies have demonstrated that positive effects can accrue from developed skills.

In the classroom

Students with a repertoire of learning strategies can measure their own progress towards explicit goals. When students use these strategies to strengthen their opportunities for learning, they simultaneously increase their skills of self-awareness, personal control and positive self-evaluation.

Three possible phases of teaching about learning strategies include:

1. Modelling, in which the teacher exhibits the desired behaviour;
2. Guided practice, in which students perform with help from the teacher; and
3. Application, during which students act independently of the teacher.

As an example, a successful programme of 'reciprocal teaching' fosters reading comprehension by having students take turns in leading dialogues on pertinent features of texts. By as-

suming the roles of planning and monitoring ordinarily exercised by teachers, students learn self-management. Perhaps that is why tutors learn from tutoring, and why it is said: 'To learn something well, teach it.'

References: Haller, Child & Walberg, 1988; Palincsar & Brown, 1984; Pearson, 1985; Walberg & Haertel, 1997.

7. Tutoring

Teaching one student or a small number with the same abilities and instructional needs can be remarkably effective.

Research findings

Tutoring gears learning to student needs. It has yielded large learning effects in several dozen studies. It yields particularly large effects in mathematics—perhaps because of the subject's well-defined sequence and organization. If students fall behind in a fast-paced mathematics class, they may never catch up unless their particular problems are identified and remedied. This individualized assessment and follow-up process is the virtue of tutoring and other means of adaptive instruction.

In the classroom

Peer tutoring (tutoring of slower or younger students by more advanced students) appears to work nearly as well as teacher tutoring; with sustained student practice it might be equal to teacher tutoring in some cases. Significantly, peer tutoring promotes effective learning in tutors as well as tutees. The need to organize one's thoughts in order to impart them intelligibly to others, the need to become conscious of the value of time, and the need to learn managerial and social skills are probably the main reasons for benefits to the tutor.

Even slower-learning students and those with disabilities can be in the position of teaching to others if they are given the extra time and practice that may be required to master a skill. This can give them a positive experience and increase their feelings of self-esteem. The success of two other practices in this booklet—the teaching of learning strategies and cooperative learning—is attributable to instructional features similar to those of tutoring.

References: Cohen, Kulik & Kulik, 1982; Ehly, 1980; Medway, 1991; Walberg & Haertel, 1997.

8. Mastery learning

For subject-matter to be learned step by step, thorough mastery of each step is often optimal.

Research findings

More than fifty studies show that careful sequencing, monitoring and control of the learning process raise the learning rate. Pre-testing helps determine what should be studied; this allows the teacher to avoid assigning material that has already been mastered or for which the student does not yet have the prerequisite skills. Ensuring that students achieve mastery of initial steps in the sequence helps ensure that they will make satisfactory progress in subsequent, more advanced steps. Frequent assessment of progress informs teachers and students when additional time and corrective remedies are needed. Mastery learning appears to work best when the subject-matter is well organized.

In the classroom

Because of its emphasis on outcomes and careful monitoring of progress, mastery learning can save learners' time. It allows more time and remediation for students who need it. It also enables faster learners to skip material they already know. Since mastery learning suits instruction to the needs of each student, it can work better than giving the whole class the same lesson at the same time. Such whole-class teaching may be too hard for some learners and too easy for others.

Mastery learning programmes require special planning, materials and procedures. Teachers must be prepared to identify the components of instruction, develop assessment strategies so that individual students are appropriately placed in the instructional continuum, and provide reinforcement and corrective feedback—while continuously engaging students in lessons.

References: Bloom, 1988; Guskey, 1990; Kulik, Kulik & Bangert-Drowns, 1990; Walberg & Haertel, 1997; Waxman & Walberg, 1999.

9. Co-operative learning

Students in small, self-instructing groups can support and increase each other's learning.

Research findings

As shown by more than fifty studies, learning proceeds more effectively than usual when exchanges among teachers and learners are frequent and specifically directed towards students' problems and interests. In whole-class instruction, only one person can speak at a time, and shy or slow-learning students may be reluctant to speak at all. When students work in groups of two to four, however, each group member can participate extensively, individual problems are more likely to become clear and to be remedied (sometimes with the teacher's assistance), and learning can accelerate.

In the classroom

With justification, co-operative learning has become widespread. Not only can it increase academic achievement, but also it has other virtues. By working in small groups, students learn teamwork, how to give and receive criticism, and how to plan, monitor and evaluate their individual and joint activities with others.

It appears that modern workplaces increasingly require such partial delegation of authority, group management and co-operative skills. Like modern managers, teachers may need to become more like facilitators, consultants and evaluators, rather than supervisors. Nonetheless, researchers do not recommend that co-operative learning take up the whole school day; the use of a variety of procedures, rather than co-operative learning alone, is considered to be most productive.

In addition, co-operative learning means more than merely assigning children to small groups. Teachers must also carefully design and prepare for the small-group setting. Students need instruction in skills necessary to operate successfully in small groups. Decisions must be made about the use of individual or group accountability. Care must be taken in establishing the mix of strengths and needs represented by students in

the groups. Attention to these details will increase the likelihood that the co-operative groups will produce increased learning.

References: Hertz-Lazarowitz & Miller, 1992; Johnson & Johnson, 1989; Walberg & Haertel, 1997; Waxman & Walberg, 1999.

10. Adaptive education

A variety of instructional techniques adapting lessons to individual students and small groups raises achievement.

Research findings

Adaptive instruction is an integrated diagnostic-prescriptive process that combines several of the preceding practices—tutoring, mastery and co-operative learning, and instruction in learning strategies—into a classroom management system to tailor instruction to individual and small-group needs. The achievement effects of adaptive programmes have been demonstrated. The broader effects of adaptive instruction are probably underestimated, since it aims at diverse ends that are difficult to measure, including student autonomy, intrinsic motivation, teacher and student choice and parental involvement.

In the classroom

Adaptive education requires implementation steps executed by a master teacher, including planning, time allocation, task delegation to aides and students, and quality control. Unlike most other practices, it is a comprehensive programme for the whole school day, rather than a single method that requires simple integration into one subject or into a single teacher's repertoire. Its focus on the individual student requires that barriers to learning are first diagnosed and then a plan developed to address those needs.

A student with special needs or experiencing academic difficulties becomes the shared responsibility of a team of teachers and specialists. Such an approach to education calls for teachers to develop a broad spectrum of teaching approaches, along with knowledge of when to use each of them most productively, and to co-ordinate their efforts with those of other professionals providing support to a student. Time and opportunity to do this are crucial for implementation of adaptive education.

Skilful professional management is required to integrate all aspects of the programme. For example, curricular co-ordina-

tion means more than a plan for the teaching of subject-matter skills and knowledge across grade levels as it applies to *all* students. Instead, it encompasses the relationship of that curriculum to the abilities and needs of *each* student. Consequently, central-office staff, principals and teachers need more than usual training to install and maintain adaptive programmes.

As goals for school become more clear and uniform, it should be increasingly possible to develop and employ systemic approaches, such as adaptive education.

References: Walberg & Haertel, 1997; Wang 1992; Wang, Haertel & Walberg, 1998; Wang, Oates & Whiteshew, 1995; Wang & Zollers, 1990; Waxman & Walberg, 1999.

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